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UNDERGROUND
ENGINEERING &
ENVIRONMENTAL
SOLUTIONS

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HALEY & ALDRICH

14 November 2001
File No. 27285-014

Mr. Brian Mossman
Boeing Realty Corporation
3855 Lakewood Blvd.
Building 1A MC D001-0097
Long Beach, CA 90846

Subject: **Temporary Groundwater Monitoring Well Conversion Work Plan**
Former Boeing C-6 Facility
Los Angeles, California

Haley & Aldrich, Inc. has prepared work plan for the conversion of nine Temporary Monitoring Wells (TMWs) to permanent groundwater monitoring wells at the former Boeing C-6 Facility (subject property), in Los Angeles, California.

Groundwater monitoring wells TMW-1 through TMW-9 were installed as temporary monitoring wells by Kennedy/Jenks Consultants (Kennedy/Jenks) in 1998 as part of a program to obtain preliminary groundwater information at locations within Parcel C of the site. The locations of the wells and former locations of the buildings are shown on Figure 1. Since the wells were intended to be temporary, the annular space between the lower bentonite seal and the surface seal was not grouted. These wells, however, have become part of the site-wide groundwater monitoring program and need to be converted to permanent groundwater monitoring wells. The following sections discuss the proposed well conversion.

1.0 BACKGROUND

1.1 SITE LOCATION AND DESCRIPTION

The subject property comprises approximately 170 acres at 19503 South Normandie Avenue in Los Angeles, California. The subject property is bordered on the north by West 190th Street; on the east by South Normandie Avenue; on the south by Montrose Chemical Company; and on the west by Western Avenue, the former Capitol Metals, and International Light Metals facilities.

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19 November 2001
C6-BRC-T-01-026

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

BOEING

Attention: John Geroch

Subject: **TEMPORARY GROUNDWATER MONITORING WELL CONVERSION WORK PLAN FOR BOEING REALTY CORPORATION, FORMER C-6 FACILITY, 19503 SOUTH NORMANDIE AVENUE, LOS ANGELES, CA**

Dear Mr. Geroch:

Please find enclosed for your review, a copy of the subject document prepared by Haley & Aldrich for Boeing Realty Corporation.

If you have any questions concerning this document, please contact the undersigned at 562-593-8623.

Sincerely,

Stephanie Sibbett
Boeing Realty Corporation

Cc: Mario Stavale, Boeing Realty Corporation

enclosure

In 1952, the Douglas Aircraft Company used the facility to manufacture aircraft and aircraft components until approximately 1992.

Aboveground and underground structures have been removed from the site and the site is currently being graded for redevelopment.

1.2 HYDROGEOLOGY/GEOLOGY

The hydrogeologic units relevant to this scope of work are comprised of Holocene and Pleistocene-age alluvium deposits. The upper portions of the subject property geology from ground surface to approximately 140 feet below ground surface (bgs) are composed of the Bellflower Aquiclude consisting of clays, silts, and fine sands. The Gage Aquifer (approximately 150 to 180 feet bgs) underlies the Bellflower Aquiclude (Montgomery Watson, 1994).

At the subject property groundwater occurs at approximately 60 to 70 feet bgs in a semi-perched aquifer flowing south-southeast at an approximate hydraulic gradient of 0.0007 feet per foot (ft/ft) to 0.0027 ft/ft (Kennedy/Jenks 2000b). Groundwater at the subject property is primarily impacted with the volatile organic compounds trichloroethylene, 1,1-dichloroethylene, and 1,1,1-trichloroethane.

2.0 WELL CONVERSION SCOPE OF WORK

The nine TMWs were designed and installed to evaluate the shallow groundwater quality within Parcel C of the subject property. As such, the wells were designed to penetrate no deeper than 20 feet into the water table. The annular spaces of the boreholes were left open from approximately 56-feet bgs to within two feet of the surface, where the boreholes were packed and filled with hydrated bentonite pellets to the surface. A summary of the well construction details, based on Kennedy/Jenks boring logs is included in Table 1 and well construction logs are in Appendix A.

The subject property is currently being redeveloped, however, these wells are part of a continuing groundwater monitoring program. To minimize the potential for surface water infiltration through the ungrouted annular spaces, Haley & Aldrich proposes a well conversion program that includes the removal and inspection of the well heads, grouting the annular spaces, and providing surface protection for the nine TMWs. Well conversion activities will

be performed in general acordance with State of California Water Well Standards as described in Bulletins 74-81 an 74-90.

2.1 Well Head Removal and Inspection

Prior to grouting, any existing protective casing or well vaults and the upper bentonite seal will be removed to expose the well annulus. The PVC well casing will be checked for tightness and proper height and adjusted if necessary. The depth of the open annulus will also be measured to verify the accuracy of the well construction log and to assist in calculating the volume of grout needed. Precautions will be taken to ensure that soil and debris does not enter the well annulus during these activities.

2.2 Grout Annular Space

The volume of grout required to fill the annulus from the lower bentonite seal to approximately two feet below expected final grade will be calculated. Neat cement grout (ASTM C150 – Type I/II Portland Cement) will be mixed at a ratio of one 94-pound sack of Portland cement to 5 to 6 gallons of potable water. The grout will be mixed in a clean 55-gallon drum using a pneumatic mixing device to provide uniformity and ensure that no lumps exist. The grout will be pumped through a 1.5-inch PVC tremie pipe lowered to the bottom of the well annulus to the level of the existing bentonite seal, filling the annulus from the bottom up. Haley & Aldrich will record the volume of grout placed in the well annulus. The grout seal will be observed for subsidence and "topped-off" as needed to maintain the seal to within two feet of the ground surface.

2.3 Surface Completion

The wells will have temporary surface completions to protect them from damage during the grading and redevelopment of the subject property. Temporary surface completions will consist of hydrated bentonite pellets placed in six-inch lifts to above existing site grade, a locking well cap, and barricading to prevent damage. A typical temporary surface completion is shown in Figure 2.

At the completion of site redevelopment and establishment of final surface grade, permanent surface protection will be installed consisting of a flush-mount well vault for wells within traffic areas or an aboveground locking protective casing for wells in landscaped areas. A typical flush-mount well vault and aboveground protective casing is shown in Figure 2. Once

completed, well casing elevations will be surveyed to an accuracy of 0.01 foot relative to mean sea level.

3.0 PERMITTING

Kennedy/Jenks submitted an application for well permit for TMW-1 through TMW-9 to the County of Los Angeles Department of Health Services on June 25, 1998. The application was approved the same day and is included in Appendix B. No further permitting should required for the conversion of these wells.

4.0 HEALTH AND SAFETY

The site-specific Health and Safety Plan (HASP) prepared by Haley & Aldrich, dated 8 June 2001, will be followed during the TMW conversion activities.

5.0 PERSONAL PROTECTIVE EQUIPMENT

All site personnel will be equipped, at a minimum, with Level D safety gear (e.g. hard hat, steel-toed boots, and traffic vest). It is not anticipated that hazardous materials will be encountered during TMW conversion activities. Due to the presence of volatile organic compounds (VOCs) in soil, it is possible that VOC vapors from the well annulus may be displaced into the breathing zone during grouting activities. A photoionization detector will be used to monitor the breathing zone in accordance with the HASP.

6.0 REPORTING

Upon completion of the TMW conversion activities, a letter report will be prepared describing field methods and results of the field activities. Well construction logs will be included with the report. The report will be submitted to the Regional Water Quality Control Board – Los Angeles Region by January 30, 2002.

We appreciate this opportunity to be of service. If you have any questions, please do not hesitate to contact the undersigned.

Sincerely yours,
HALEY & ALDRICH, INC.

Richard M. Farson, P.E.
Senior Engineer

Scott P. Zachary
Vice President

Enclosure

References:

Kennedy/Jenks. 1999. Installation of Temporary Monitoring Wells Area of Buildings 1 and 2. Volume 1. Boeing Realty Corporation, C-6 Facility. Los Angeles, California. October.

Kennedy/Jenks. 2000b. Groundwater Monitoring Report, 2nd Quarter 2000, Boeing Realty Corporation's C-6 Facility, Los Angeles, CA. July.

Montgomery Watson. 1994. Conceptual Design of Final Soil and Groundwater Remediation System at the Douglas Aircraft Company. March.

Tables

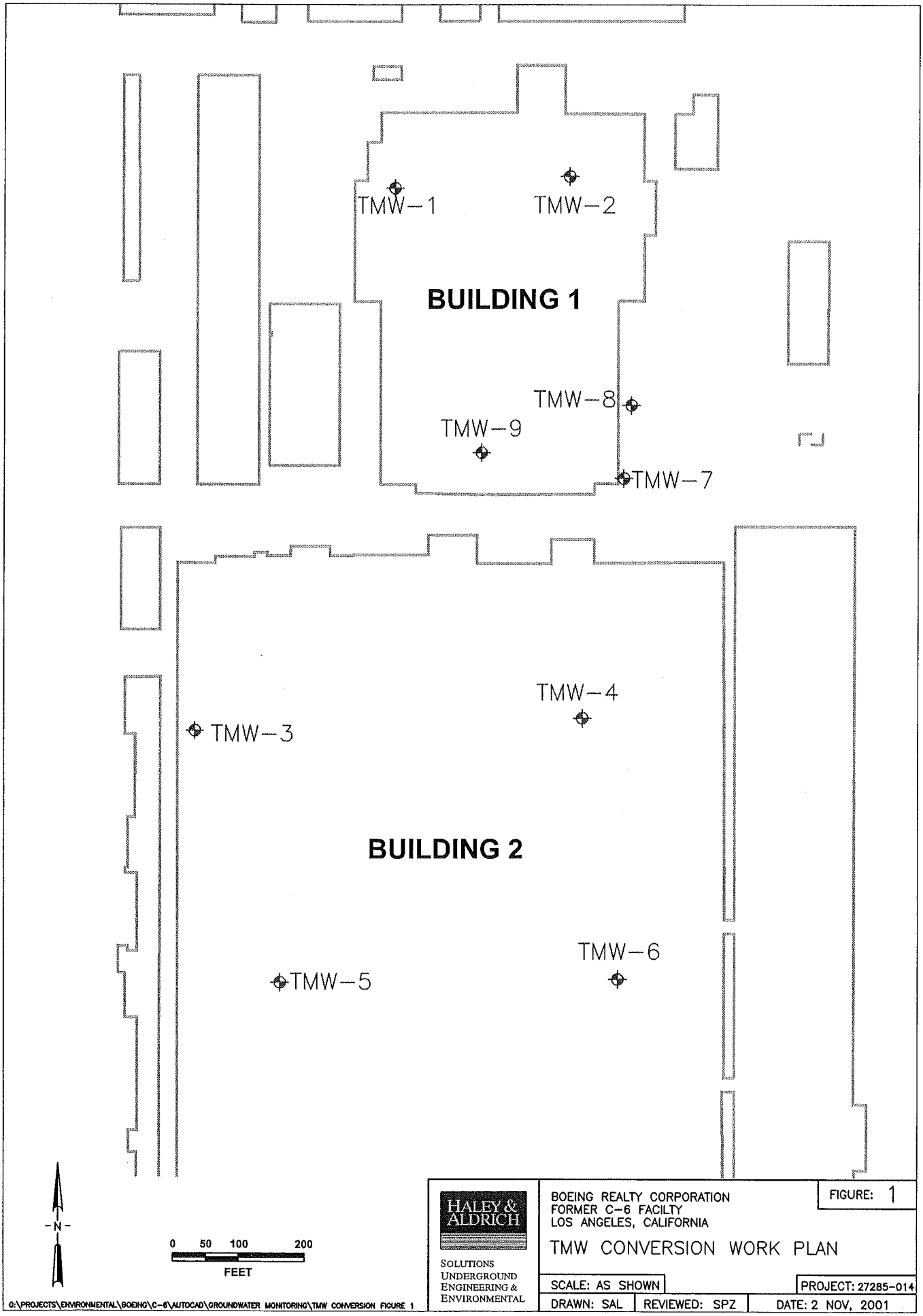
TABLE I

Temporary Monitoring Well Construction Details
Boeing Realty Corporation Former C-6 Facility
Los Angeles, California

Name	Boring Total Depth (feet bgs)	Screen Depth Interval (feet bgs)	Depth to top of Filter Pack (feet bgs)	Casing Diameter (inches)	Casing Type	Slot Size (inches)	Date Drilled
TMW-1	86	61-81	59	2	Sch 40 PVC	0.010	6/28/1998
TMW-2	87	62-82	57	2	Sch 40 PVC	0.010	6/28/1998
TMW-3	87	62.5-82.5	60	2	Sch 40 PVC	0.010	7/21/1998
TMW-4	86	60-80	58	2	Sch 40 PVC	0.010	6/30/1998
TMW-5	86	61.3-81.3	58.9	2	Sch 40 PVC	0.010	7/2/1998
TMW-6	86	61.2-81.2	59.1	2	Sch 40 PVC	0.010	7/1/1998
TMW-7	89.5	64-84	62	2	Sch 40 PVC	0.010	6/29/1998
TMW-8	89.5	61-81	59	2	Sch 40 PVC	0.010	6/29/1998
TMW-9	86	61-81	59	2	Sch 40 PVC	0.010	6/30/1998

bgs = below ground surface

Figures



G:\PROJECTS\ENVIRONMENTAL\BOEING\C-6\AUTOCAD\GROUNDWATER MONITORING\TMW CONVERSION FIGURE 1

HALEY & ALDRICH
SOLUTIONS UNDERGROUND ENGINEERING & ENVIRONMENTAL

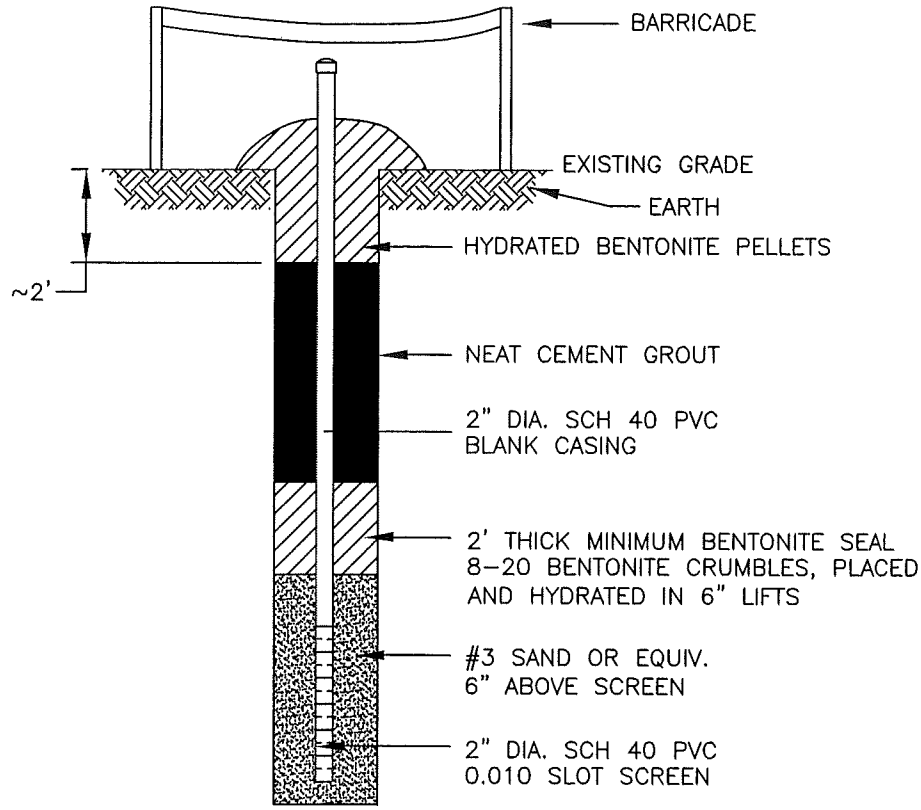
BOEING REALTY CORPORATION
FORMER C-6 FACILTY
LOS ANGELES, CALIFORNIA

FIGURE: 1

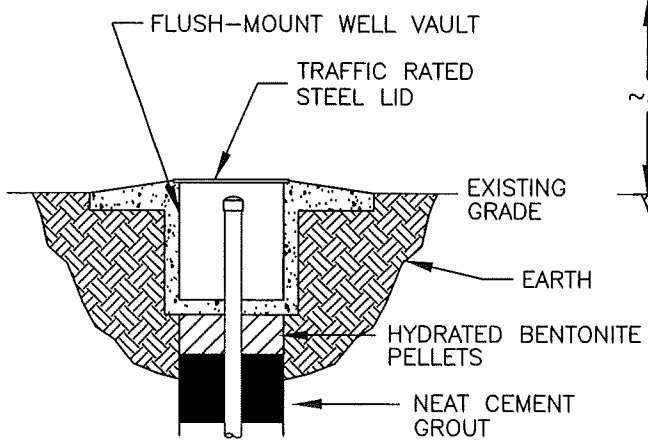
TMW CONVERSION WORK PLAN

SCALE: AS SHOWN		PROJECT: 27285-014
DRAWN: SAL	REVIEWED: SPZ	DATE: 2 NOV, 2001

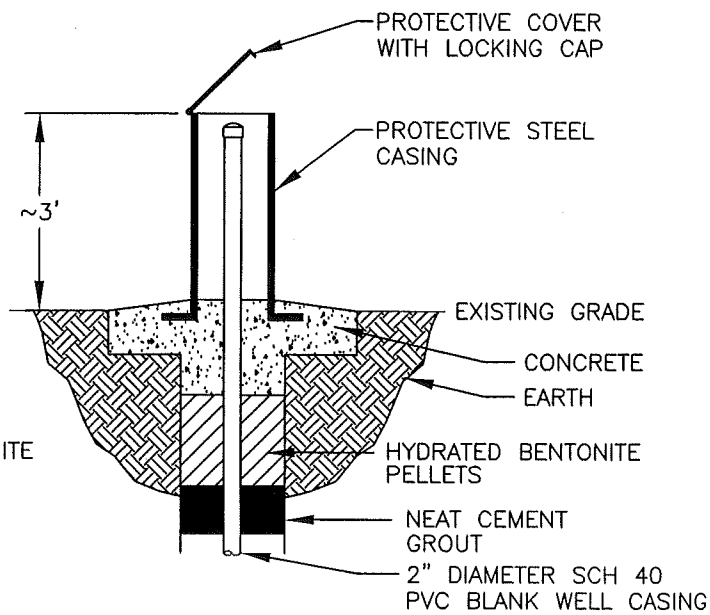
TEMPORARY SURFACE COMPLETION



PERMANENT SURFACE COMPLETIONS



TRAFFIC AREA



LANDSCAPE AREA

HALEY & ALDRICH
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BOEING REALTY CORPORATION
FORMER C-6 FACILTY
LOS ANGELES, CALIFORNIA

FIGURE: 2

TMW CONVERSION WORK PLAN

SCALE: NTS | PROJECT: 27285-014
DRAWN: SAL | REVIEWED: RMF | DATE: 12 NOV, 2001

G:\PROJECTS\ENVIRONMENTAL\BOEING\C-6\AUTOCAD\GROUNDWATER MONITORING\TMW CONVERSION FIGURE 2

Appendix A

Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Building 1		Boring/Well Name: TMW-1	
DRILLING COMPANY: West Hazmat	DRILLER: Ruben Lares	Project Name: Boeing C-6	
DRILLING METHOD (S): CME 75, Hollow Stem Auger (LAR)	DRILL BIT (S) SIZE: 8"	Project Number: 984006.00	
BLANK CASING: 2" PVC Schedule 40	FROM +1 TO 61 FT	ELEVATION: Not Surveyed	TOTAL DEPTH: 86 ft.
PERFORATED CASING: 2" PVC Schedule 40, 0.010" slot	FROM 61 TO 81 FT	DATE STARTED: 6/28/98	DATE COMPLETED: 6/28/98
SIZE AND TYPE OF FILTER PACK: Lonestar 2/12 Sand	FROM 59 TO 86 FT	DEPTH TO WATER: 66.0 ft.	
SEAL: Enviroplug Medium Bentonite Chips	FROM 56 TO 59 FT	LOGGED BY: M. Balderman	
GROUT: No Grout (Temporary Well)	FROM TO FT	SAMPLING METHODS: 2" Split Barrel Sampler, 140 lb. Hammer	WELL COMPLETION: ☐ SURFACE HOUSING NONE ☐ STAND PIPE ____ FT

SAMPLES Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
					0					Concrete, 8"
■	■	■	9 12 15							
■	■	■	14 14 21	0.2				CL	7.5YR 3/3	Fine Sandy CLAY: dark brown, damp, medium stiff to stiff, mottled with CaCO3
■	■	■	12 17 18	0.8	5			CL	7.5YR 3/3	hard nodules of carbonate up to 1/4", damp, medium stiff
■	■	■	18 37 40	0.9	10			CL	7.5YR 4/4	Silty CLAY: brown, trace of fine sand, damp, stiff
■	■	■	9 30 32	1.0	20			SM	7.5YR 4/4	Fine Silty SAND: brown, 60% sand, trace of fine mica, damp, dense
					25	No Grout				
■	■	■	8 30 33	1.4	30					
					35					

Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-1
Project Name Boeing C-6
Project Number 984006.00

Depth (feet)	Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	USCS Log	Munsell Color	
35								
40	■	■	■	11 38 40		SM	7.5YR 5/3	Fine Silty SAND: brown, 80% sand, trace of fine mica, damp, dense
45								
50	■	■	■	8 40 45	2.0	SM	7.5YR 4/2	brown, 65% sand, minor clay, very dense
55								
60								
65	■	■	■	22 43 50	3.9	SM/ SP &CL	7.5YR 4/2	interbedded with fine sand, moist water at 66 feet
	■	■	■	21 37 50	5.1			interbedded with fine sandy clay
70								
75								
80								

WELL CONSTRUCTION: No Grout; Blank Casing; Bentonite Seal; Sand Filter; Screened Casing; Depth to Water; Bottom of Screen

Graphic Log

Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-1
Project Name Boeing C-6
Project Number 984006.00

SAMPLES					Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	
Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)						
					80					Fine Silty SAND (continued)
						Bottom of Screen				
					85	Bottom of Well				
										Boring Terminated at 86 feet.
					90					
					95					
					100					
					105					
					110					
					115					
					120					
					125					

Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Building 1		Boring/Well Name: TMW-2	
DRILLING COMPANY: West Hazmat	DRILLER: Tracy	Project Name: Boeing C-6	
DRILLING METHOD (S): CME 75, Hollow Stem Auger	DRILL BIT (S) SIZE: 8"	Project Number: 984006.00	
BLANK CASING: 2" PVC Schedule 40	FROM +1 TO 62 FT	ELEVATION: Not Surveyed	TOTAL DEPTH: 87 ft.
PERFORATED CASING: 2" PVC Schedule 40, 0.010" slot	FROM 62 TO 82 FT	DATE STARTED: 6/28/98	DATE COMPLETED: 6/28/98
SIZE AND TYPE OF FILTER PACK: Lonestar 2/12 Sand	FROM 57 TO 87 FT	DEPTH TO WATER: 67.0 ft.	
SEAL: Enviroplug Medium Bentonite Chips	FROM 51 TO 57 FT	LOGGED BY: J. Knight	
GROUT: No Grout (Temporary Well)	FROM TO FT	SAMPLING METHODS: 2" Split Barrel Sampler, 140 lb. Hammer	WELL COMPLETION: ☐ SURFACE HOUSING NONE ☐ STAND PIPE ____ FT

SAMPLES Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
										Concrete, 6"
								CL	2.5Y 4/4	Silty CLAY: olive brown, slightly moist, stiff
					5			ML	10YR 4/6	Clayey SILT: dark yellowish brown, slightly moist, stiff
			17 26 31	100	10				2.5Y 4/4	olive brown, hard
			10 13 30	104	20				2.5Y 5/4	decreasing clay, very stiff
					25	No Grout				
			12 21 31	190	30					
					35					

Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-2
Project Name Boeing C-6
Project Number 984006.00

Depth (feet)	Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	
35										Clayey SILT (continued)
40	■	■	■	5 15 17	183					some fine sand, and some thin sand lenses, very stiff
										change noted by driller at 43'
45						No Grout				
50	■	■	■	17 25 32	354	Blank Casing		SM	2.5Y 5/6	Silty SAND: light olive brown, fine, slightly moist, dense
55						Bentonite Seal				change noted by driller at 58'
60	■	■		18 50 50 50 50		Sand Filter		ML	2.5Y 5/6	Sandy SILT: light olive brown, fine, moist, hard
						Screened Casing				increasing sand
65	■	■	■	20 23 30	2025	Depth to Water				very moist, hard, some clayey lenses
	■			50						water at 67'
								SM	2.5Y 4/3	Silty SAND: olive brown, fine, wet, with lenses of clayey silt
70										
75										
80						Bottom of Screen				

Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-2
Project Name Boeing C-6
Project Number 984006.00

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	
					80					Silty CLAY (continued)
						Bottom of Screen				
					85	Bottom of Well				
					90					Boring Terminated at 87 feet.
					95					
					100					
					105					
					110					
					115					
					120					
					125					

Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Building 2, Patio 11 West		Boring/Well Name: TMW-3	
DRILLING COMPANY: West Hazmat	DRILLER: Ruben Lares	Project Name: Boeing C-6	
DRILLING METHOD (S): CME 75, Hollow Stem Auger (LAR)	DRILL BIT (S) SIZE: 8"	Project Number: 984006.00	
BLANK CASING: 2" PVC Schedule 40	FROM +0.5 TO 62.5 FT	ELEVATION: Not Surveyed	TOTAL DEPTH: 87 ft.
PERFORATED CASING: 2" PVC Schedule 40, 0.010" slot	FROM 62.5 TO 82.5 FT	DATE STARTED: 7/21/98	DATE COMPLETED: 7/21/98
SIZE AND TYPE OF FILTER PACK: Lonestar 2/12 Sand	FROM 60 TO 85.6 FT	DEPTH TO WATER: 67 ft.	
SEAL: Enviroplug Medium Bentonite Chips	FROM 60 TO 58 FT	LOGGED BY: M. Balderman	
GROUT: No Grout (Temporary Well)	FROM TO FT	SAMPLING METHODS: 2" Split Barrel Sampler, 140 lb. Hammer	WELL COMPLETION: ☐ SURFACE HOUSING NONE ☐ STAND PIPE ____ FT

SAMPLES Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
										Concrete, 8"
			6 8 10					CL	2.5YR 3/1	Silty CLAY: dark reddish gray, minor fine sand, damp, medium stiff
			6 9 20	10.8						
			20 22 28	9.7	5				7.5YR 4/3	brown, stiff, mottled with light tan CaCO3
			5 9 20	13.9	10			ML	2.5Y 3/3	Fine Sandy SILT: dark olive brown, 40% sand, minor clay, damp, very stiff
			25 35 40	6.2	20			CL	2.5Y 4/3	Fine Sandy CLAY: olive brown, 30% sand, damp, stiff
			12 22 45	10.4	30	No Grout		SM	10YR 6/4	Fine Silty SAND: light yellowish brown, 70% sand, trace of fine mica, damp, dense

Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-3
Project Name Boeing C-6
Project Number 984006.00

SAMPLES Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	
					35					Fine Silty SAND (continued)
			12 24 30	17.5	40			SM	10YR 6/2	light brownish gray, 75% sand, damp, dense
					45	No Grout				
			24 21 30	6.3	50	Blank Casing		SM	10YR 5/4	yellowish brown, 70% sand, trace of fine mica, damp, dense
					55					
					60	Bentonite Seal Sand Filter				
						Screened Casing				
			12 28 50 14 25 50	7.2	65	Depth to Water		CL	5GY 6/1	Silty CLAY: greenish gray, minor fine sand, moist, very stiff water at 67'
					70					
										sandy
					75					
					80					

Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-3
Project Name Boeing C-6
Project Number 984006.00

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	
					80	Bottom of Screen				Silty CLAY (continued)
					85	Bottom of Well				
					90					Boring Terminated at 87 feet.
					95					
					100					
					105					
					110					
					115					
					120					
					125					

Well Construction Log

Kennedy/Jenks Consultants

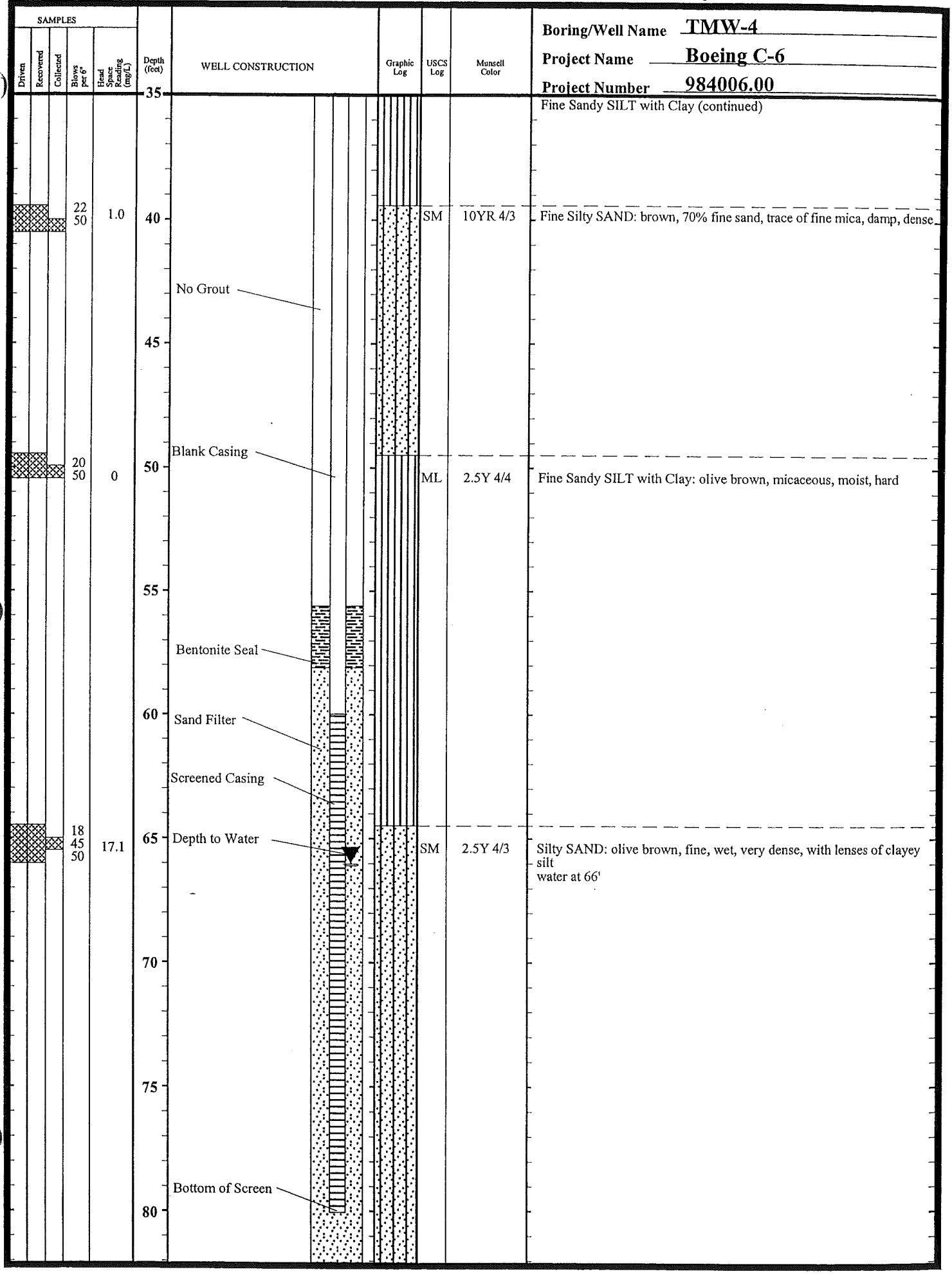
BORING LOCATION: Building 2, Patio 11 East		Boring/Well Name: TMW-4	
DRILLING COMPANY: West Hazmat	DRILLER: Ruben Lares	Project Name: Boeing C-6	
DRILLING METHOD (S): CME 75, Hollow Stem Auger (LAR)	DRILL BIT (S) SIZE: 8"	Project Number: 984006.00	
BLANK CASING: 2" PVC Schedule 40	FROM +1 TO 61 FT	ELEVATION: Not Surveyed	TOTAL DEPTH: 86 ft.
PERFORATED CASING: 2" PVC Schedule 40, 0.010" slot	FROM 60 TO 80 FT	DATE STARTED: 6/30/98	DATE COMPLETED: 6/30/98
SIZE AND TYPE OF FILTER PACK: Lonestar 2/12 Sand	FROM 58 TO 86 FT	DEPTH TO WATER: 66.0 ft.	
SEAL: Enviroplug Medium Bentonite Chips	FROM 55.5 TO 58 FT	LOGGED BY: M. Balderman/ J. Knight	
GROUT: No Grout (Temporary Well)	FROM TO FT	SAMPLING METHODS: 2" Split Barrel Sampler, 140 lb. Hammer	WELL COMPLETION: ☐ SURFACE HOUSING NONE ☐ STAND PIPE ____ FT

SAMPLES Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
										Concrete, 4"
■			20 30 30	1.1				CL	7.5YR 4/4	Silty CLAY: brown, minor fine sand, damp, stiff
■	■	■	30 50	0.6	5			CL	2.5Y 4/4	Fine Sandy CLAY: olive brown, 30% fine sand, dry, hard
■	■	■	17 20 30	0.7	10			CL	10YR 5/4	Fine Sandy CLAY: yellowish brown, 35% fine sand, damp, stiff
					15					
■	■	■		0.9	20			ML	10YR 5/4	Clayey SILT: yellowish brown, minor fine sand, damp, stiff
					25	No Grout				
■	■	■	18 32 50	0.9	30			ML	10YR 5/3	Fine Sandy SILT with Clay: brown, 35% fine sand, damp, stiff
					35					

Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-4
Project Name Boeing C-6
Project Number 984006.00



Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-4
Project Name Boeing C-6
Project Number 984006.00

SAMPLES: Driven	SAMPLES: Recovered	SAMPLES: Collected	SAMPLES: Blows per 6"	SAMPLES: Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	
					80					Silty SAND (continued)
					85	Bottom of Well				
					90					Boring Terminated at 86 feet.
					95					
					100					
					105					
					110					
					115					
					120					
					125					

Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Building 2, Patio 31 West		Boring/Well Name: TMW-5	
DRILLING COMPANY: West Hazmat	DRILLER: Ruben Lares	Project Name: Boeing C-6	
DRILLING METHOD (S): CME 75, Hollow Stem Auger (LAR)	DRILL BIT (S) SIZE: 8"	Project Number: 984006.00	
BLANK CASING: 2" PVC Schedule 40	FROM +1 TO 61.3 FT	ELEVATION: Not Surveyed	TOTAL DEPTH: 86 ft.
PERFORATED CASING: 2" PVC Schedule 40, 0.010" slot	FROM 61.3 TO 81.3 FT	DATE STARTED: 7/2/98	DATE COMPLETED: 7/2/98
SIZE AND TYPE OF FILTER PACK: Lonestar 2/12 Sand	FROM 58.9 TO 86 FT	DEPTH TO WATER: 65.0 ft.	
SEAL: Enviroplug Medium Bentonite Chips	FROM 56.2 TO 58.9 FT	LOGGED BY: M. Balderman	
GROUT: No Grout (Temporary Well)	FROM TO FT	SAMPLING METHODS: 2" Split Barrel Sampler, 140 lb. Hammer	WELL COMPLETION: ☐ SURFACE HOUSING NONE ☐ STAND PIPE ____ FT

SAMPLES Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
										Concrete, 6"
■	■	■	7 10 14	3.2				CL	5YR 4/2	Silty CLAY: dark reddish gray, minor fine sand, damp, medium stiff
■			25 50	7.9	5			CL	7.5YR 4/3	Fine Sandy CLAY: brown, 30% fine sand, damp, hard
■	■	■	12 17 20	22.2	10			SC/ CL	7.5YR 5/2	Fine Sandy CLAY/ Clayey SAND: brown, 50% fine sand, damp dense
■	■	■	20 50	28.0	20			CL	7.5YR 5/2	Fine Sandy CLAY: brown, 35% fine sand, damp, hard
■	■	■	20 25 45	90	30	No Grout		SP	5GY 6/1 10YR 5/6	Fine SAND with minor Silt: mottled gray and yellowish brown, trace of fine mica, damp, dense
					35					

Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-5
Project Name Boeing C-6
Project Number 984006.00

SAMPLES Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	
					35					Fine SAND with Minor Silt (continued)
			23 50	112	40				10YR 7/6	yellow
					45	No Grout				
			20 50	160	50	Blank Casing		SC	7.5YR 5/4	Fine Clayey SAND: brown, increasing clay
								CL	2.5Y 5/3	Silty CLAY: light olive brown, minor fine sand, damp, hard
					55					
						Bentonite Seal				
					60	Sand Filter				
						Screened Casing				
						Depth to Water				
			20 50 5 20 38	250	65			SM	2.5Y 5/3	Fine Silty SAND:light olive brown, 80% sand, trace of fine mica, wet, dense water at 65'
					70					
					75					
					80	Bottom of Screen				

Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-5
Project Name Boeing C-6
Project Number 984006.00

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	
					80	Bottom of Screen				Fine Silty SAND (continued)
					85	Bottom of Well				Boring Terminated at 86 feet.
					90					
					95					
					100					
					105					
					110					
					115					
					120					
					125					

Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Building 2, Patio 31 East		Boring/Well Name: TMW-6	
DRILLING COMPANY: West Hazmat	DRILLER: Ruben Lares	Project Name: Boeing C-6	
DRILLING METHOD (S): CME 75, Hollow Stem Auger (LAR)	DRILL BIT (S) SIZE: 8"	Project Number: 984006.00	
BLANK CASING: 2" PVC Schedule 40	FROM +1 TO 61.2 FT	ELEVATION: Not Surveyed	TOTAL DEPTH: 86 ft.
PERFORATED CASING: 2" PVC Schedule 40, 0.010" slot	FROM 61.2 TO 81.2 FT	DATE STARTED: 7/1/98	DATE COMPLETED: 7/1/98
SIZE AND TYPE OF FILTER PACK: Lonestar 2/12 Sand	FROM 59.1 TO 86 FT	DEPTH TO WATER: 65.5 ft.	
SEAL: Enviroplug Medium Bentonite Chips	FROM 56.5 TO 59.1 FT	LOGGED BY: M. Balderman	
GROUT: No Grout (Temporary Well)	FROM TO FT	SAMPLING METHODS: 2" Split Barrel Sampler, 140 lb. Hammer	WELL COMPLETION: ☐ SURFACE HOUSING NONE ☐ STAND PIPE ____ FT

SAMPLES Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
										Concrete, 6"
■	■	■	3 4 8	280				CL	7.5YR 3/2	Fine Sandy CLAY: dark brown, 30% fine sand, wet, medium stiff
■	■	■	7 22 24	2900	5			SC	7.5YR 4/4	Fine Clayey SAND: brown, 60% fine sand, moist, dense
■	■	■	11 24 30	0	10			ML	10YR 5/3	Clayey SILT: brown, 20% fine sand, moist, stiff
■	■	■	12 15 17	0	20			SC	10YR 4/4	Fine Clayey SAND: dark yellowish brown, 55% sand, damp, dense
■	■	■	31 33 50	4.3	30	No Grout		SC SM	7.5YR 5/3	Fine Clayey/Silty SAND: brown, 70% sand, trace of fine mica, damp, dense
					35					

Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-6
Project Name Boeing C-6
Project Number 984006.00

Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	
					35					Fine Clayey/Silty SAND (continued)
			11 14 22	2.9	40			SM	10YR 5/6	Fine Silty SAND: yellowish brown, 75% fine sand, trace of fine mica, damp, dense
					45	No Grout				
			23 50	1.4	50	Blank Casing		SM	10YR 5/4	yellowish brown
					55					
					60	Bentonite Seal Sand Filter				
			22 50 25 50	0	65	Screened Casing Depth to Water		ML SM	2.5Y 5/2 5Y 4/2	Clayey SILT: grayish brown, 30% fine sand, moist, hard, grading to gray sand at 65' Fine Silty SAND: olive gray, 85% sand, trace of fine mica, wet, dense water at 65.5'
					70					
					75					
					80	Bottom of Screen				

Well Construction Log

Kennedy/Jenks Consultants

SAMPLES					Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	
Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)						
					80					Fine Silty SAND (continued)
						Bottom of Screen				
					85	Bottom of Well				
										Boring Terminated at 86 feet.
					90					
					95					
					100					
					105					
					110					
					115					
					120					
					125					

Boring/Well Name TMW-6

Project Name Boeing C-6

Project Number 984006.00

Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Outside the Southeast Corner of Building 1		Boring/Well Name: TMW-7	
DRILLING COMPANY: West Hazmat	DRILLER: Ruben Lares	Project Name: Boeing C-6	
DRILLING METHOD (S): CME 75, Hollow Stem Auger (LAR)	DRILL BIT (S) SIZE: 8"	Project Number: 984006.00	
BLANK CASING: 2" PVC Schedule 40	FROM +1 TO 64 FT	ELEVATION: Not Surveyed	TOTAL DEPTH: 89.5 ft.
PERFORATED CASING: 2" PVC Schedule 40, 0.010" slot	FROM 64 TO 84 FT	DATE STARTED: 6/29/98	DATE COMPLETED: 6/29/98
SIZE AND TYPE OF FILTER PACK: Lonestar 2/12 Sand	FROM 62 TO 89.5 FT	DEPTH TO WATER: 66 ft.	
SEAL: Enviroplug Medium Bentonite Chips	FROM 56 TO 62 FT	LOGGED BY: M. Balderman	
GROUT: No Grout (Temporary Well)	FROM TO FT	SAMPLING METHODS: 2" Split Barrel Sampler, 140 lb. Hammer	WELL COMPLETION: ☐ SURFACE HOUSING NONE ☐ STAND PIPE ____ FT

SAMPLES Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
										Asphalt, 3"
■	■	■	5 5 6	2.3				CL	7.5YR 4/2	Silty CLAY: brown, minor fine sand, damp, soft
■	■	■	12 50	0.7	5			ML	7.5YR 4/4	Clayey SILT: brown, 20% fine sand, damp, stiff
■	■	■	12 30 42	0.4	10			CL	2.5Y 5/3	Silty CLAY: light olive brown, minor fine sand and carbonate, damp, stiff
					15					
■	■	■	13 10 15	0.5	20			ML	2.5Y 4/3	Clayey SILT: olive brown, minor fine sand, trace of fine mica and carbonate, damp, medium stiff
					25	No Grout				
■	■	■	14 12 20	1.3	30			ML	2.5Y 5/4	Clayey SILT: light olive brown, minor fine sand, carbonate nodules to 3/8", damp, stiff
					35					

Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-7
Project Name Boeing C-6
Project Number 984006.00

SAMPLES Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	
					35					Clayey SILT (continued)
			12 18 31	1.7	40					
					45	No Grout				
			20 50	1.4	50			SM	10YR 6/4	Silty SAND: light yellowish brown, 70% fine sand, damp, dense
						Blank Casing				
					55					
						Bentonite Seal				
					60					
			12 17		65	Depth to Water		SM	2.5Y 4/2	Silty SAND: dark grayish brown, 75% fine sand, trace of fine mica, wet dense, with a clayey silt lense from 65 to 65.5'
			19 11 17 21			Sand Filter		SM ML	2.5Y 4/3	Fine Sandy SILT/Silty SAND: olive brown, laminated with clayey silt, wet, dense Water at 66'
						Screened Casing				
					70					
					75					
					80					

Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-7
Project Name Boeing C-6
Project Number 984006.00

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	
					80					Fine Sandy SILT/ Silty SAND (continued)
						Bottom of Screen				
					85					
						Bottom of Well				
					90					Boring Terminated at 89.5 feet.
					95					
					100					
					105					
					110					
					115					
					120					
					125					

Well Construction Log

Kennedy/Jenks Consultants

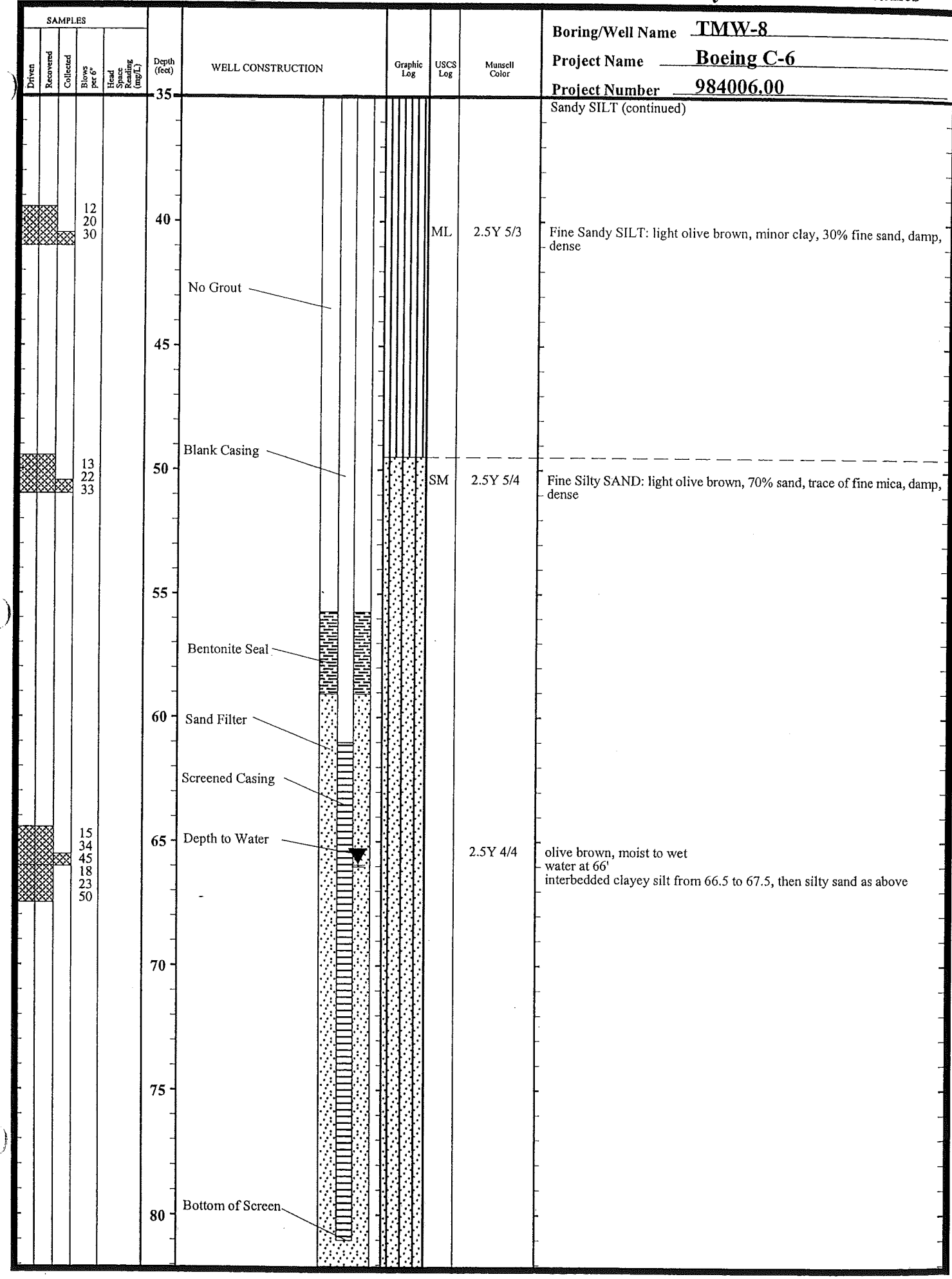
BORING LOCATION: Outside and East of Building 1		Boring/Well Name: TMW-8	
DRILLING COMPANY: West Hazmat	DRILLER: Ruben Lares	Project Name: Boeing C-6	
DRILLING METHOD (S): CME 75, Hollow Stem Auger	DRILL BIT (S) SIZE: 8"	Project Number: 984006.00	
BLANK CASING: 2" PVC Schedule 40	FROM +1 TO 61 FT	ELEVATION: Not Surveyed	TOTAL DEPTH: 86 ft.
PERFORATED CASING: 2" PVC Schedule 40, 0.010" slot	FROM 61 TO 81 FT	DATE STARTED: 6/29/98	DATE COMPLETED: 6/29/98
SIZE AND TYPE OF FILTER PACK: Lonestar 2/12 Sand	FROM 59 TO 85.5 FT	DEPTH TO WATER: 66.4 ft.	
SEAL: Enviroplug Medium Bentonite Chips	FROM 55.8 TO 59 FT	LOGGED BY: M. Balderman	
GROUT: No Grout (Temporary Well)	FROM TO FT	SAMPLING METHODS: 2" Split Barrel Sampler, 140 lb. Hammer	WELL COMPLETION: ☐ SURFACE HOUSING NONE ☐ STAND PIPE ____ FT

SAMPLES Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
										Asphalt, 3"
			6 30 32					CL	7.5YR 4/3	Silty CLAY with minor Fine Sand: brown, local fine to coarse sand partings, damp, stiff
			8 18 40		5					
			27 50		10			CL	7.5YR 4/4	brown, hard
			8 20 23		20			ML	2.5Y 4/3	Clayey SILT: olive brown, 20% fine sand, damp, stiff
					25	No Grout				
			7 14 30		30					scattered carbonate nodules to 1/4"
					35					

Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-8
Project Name Boeing C-6
Project Number 984006.00



Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-8
Project Name Boeing C-6
Project Number 984006.00

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	
					80					Fine Silty SAND (continued)
						Bottom of Screen				
					85	Bottom of Well				
										Boring Terminated at 85.5 feet.
					90					
					95					
					100					
					105					
					110					
					115					
					120					
					125					

Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION: Building 1		Boring/Well Name: TMW-9	
DRILLING COMPANY: West Hazmat	DRILLER: Ruben Lares	Project Name: Boeing C-6	
DRILLING METHOD (S): CME 75, Hollow Stem Auger	DRILL BIT (S) SIZE: 8"	Project Number: 984006.00	
BLANK CASING: 2" PVC Schedule 40	FROM +1 TO 61 FT	ELEVATION: Not Surveyed	TOTAL DEPTH: 86 ft.
PERFORATED CASING: 2" PVC Schedule 40, 0.010" slot	FROM 61 TO 81 FT	DATE STARTED: 6/30/98	DATE COMPLETED: 6/30/98
SIZE AND TYPE OF FILTER PACK: Lonestar 2/12 Sand	FROM 59 TO 86 FT	DEPTH TO WATER: 66 ft.	
SEAL: Enviroplug Medium Bentonite Chips	FROM 56.5 TO 59 FT	LOGGED BY: J. Knight	
GROUT: No Grout (Temporary Well)	FROM TO FT	SAMPLING METHODS: 2" Split Barrel Sampler, 140 lb. Hammer	WELL COMPLETION: ☐ SURFACE HOUSING NONE ☐ STAND PIPE ____ FT

SAMPLES Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
										Concrete, 8"
			12 14 21	52.0				ML	10YR 4/6	Clayey SILT: dark yellowish brown, trace of fine sand, slightly moist, very stiff
			12 22 40	86.0	5			CL	10YR 3/6	Silty CLAY: dark yellowish brown, some fine sandy lenses, slightly moist, hard
			27 30 30	85.7	10				10YR 5/4	yellowish brown, dry, hard
			12 17 23	48.2	20			ML	2.5Y 5/4	Clayey SILT: light olive brown, trace of fine sand, dry, very stiff
					25	No Grout				
			21 28 50	51.4	30			ML	2.5Y 5/6	Sandy SILT: light olive brown, fine sand, sligtly moist, hard
					35					

Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-9
Project Name Boeing C-6
Project Number 984006.00

SAMPLES Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	
					35					Sandy SILT (continued)
			20 25 30	74.1	40			SM	2.5Y 5/6	Silty Fine SAND: light olive brown, slightly moist, dense
					45	No Grout				
			23 50	114	50	Blank Casing				increasing silt content, very dense
					55					
					60	Bentonite Seal Sand Filter				
						Screened Casing				
			12 32 50 42 30 32	159	65	Depth to Water		SM	2.5Y 4/3	SAND with Silt: olive brown, fine, very moist, very dense, with silt lenses water at 66'
					70					
					75					
					80	Bottom of Screen				

Well Construction Log

Kennedy/Jenks Consultants

Boring/Well Name TMW-9
Project Name Boeing C-6
Project Number 984006.00

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (mg/L)	Depth (feet)	WELL CONSTRUCTION	Graphic Log	USCS Log	Munsell Color	
					80					SAND with Silt (continued)
						Bottom of Screen				
					85	Bottom of Well				
										Boring Terminated at 86 feet.
					90					
					95					
					100					
					105					
					110					
					115					
					120					
					125					

Appendix B

APPLICATION FOR WELL PERMIT
ENVIRONMENTAL HEALTH 2525 Corporate Place Monterey Park, Ca 91754
COUNTY OF LOS ANGELES DEPARTMENT OF HEALTH SERVICES

DATE 6-25-98

DESCRIPTION

TYPE OF PERMIT (CHECK)
- [X] NEW WELL CONSTRUCTION (nine (Temporary))
- [ ] RECONSTRUCTION OR RENOVATION
- [X] DESTRUCTION

TYPE OF WELL
- [ ] PRIVATE DOMESTIC
- [ ] PUBLIC DOMESTIC
- [ ] IRRIGATION
- [X] OBSERVATION/MONITORING
- [ ] CATHODIC
- [ ] INDUSTRIAL
- [ ] GRAVEL PACK
- [ ] TEST

TYPE OF CASING
2-inch diameter PVC schedule 40; 20 feet with 0.01 slot, 65 feet ~~stone~~ of blank

METHOD OF SEALING OF CASING
2-5 feet thickness of hydrated bentonite - see typical well construction detail attached

METHOD OF DESTRUCTION
Remove top 5-10 feet of casing, pressure grout through the screened interval, casing and annulus grout to within 6 inches of ground surface, restore graved surface to original condition

LOCATION

ADDRESS (NUMBER, STREET, AND NEAREST INTERSECTION)
19500 South Normandie Avenue. Normandie and 190th

CITY
Los Angeles

DIAGRAM (SHOW PROPERTY LINES, STREET, ADDRESS, WELL SITE, SEWERS, AND PRIVATE SEWAGE DISPOSAL SYSTEMS ALONG WITH LABELS AND DIMENSIONS)

See attached map

Post-it® Fax Note 7671	Date 10/31	# of pages ▶ 1
To TRAVIS HAMMOND	From STEPHANIE. S.	
Co./Dept. HHA	Co. BOEING	
Phone #	Phone #	
Fax # 619-280-9415	Fax #	

Permit to install (9) monitoring Wells

APPLICANT

NAME OF WELL DRILLER (PRINT)
West Hazmat

TRADE NAME

BUSINESS ADDRESS
1016 E. Katella

CITY
Anaheim, CA

NAME OF WELL OWNER (PRINT)
Boeing Realty Company

MAILING ADDRESS
4060 Lakewood Bl. Fifth Floor

CITY
Long Beach, CA 90808

I hereby agree to comply in every respect with all regulations of the County Preventive/Public Health Services and with all ordinances and laws of the County of Los Angeles and of the State of California pertaining to well construction, reconstruction and destruction. Upon completion of well and within ten days thereafter, I will furnish the County Preventive/Public Health Services with a complete log of the well, giving date drilled, depth of well, all perforations in casing, and any other data deemed necessary by such County Preventive/Public Health Services.

Jay [signature]
Applicant's Signature

DISPOSITION OF APPLICATION: (For Sanitarians Use Only)

- [X] APPROVED
- [ ] DENIED
- [ ] APPROVED WITH CONDITIONS

If denied or approved with conditions, report reason or condition here:

DATE

SANITARIAN

DATE 6/25/98

SECTION CHIEF Albert P. Cruz

When signed by Section Chief, this application is a permit.

76A558
H-13 (Rev. 3/91)

APPLICANT